GOVERNMENT OF INDIA
NON-CONVENTIONAL ENERGY SOURCES
LOK SABHA

STARRED QUESTION NO:302
ANSWERED ON:11.12.2000
POWER GENERATION FROM SOLAR ENERGY
RAMKRISHNA KUSMARIA;TEJVEER SINGH

Will the Minister of NON-CONVENTIONAL ENERGY SOURCES be pleased to state:

(a) whether vertical / horizontal panel for generation of power from solar energy are functioning in the country;

(b) if so, the details thereof, location - wise;

(c) the total quantum of power generated through these panels during each of the last three years State-wise ; and

(d) the steps being taken to promote the generation of solar energy?

Answer

MINISTER OF STATE FOR NON-CONVENTIONAL ENERGY SOURCES (INDEPENDENT CHARGE) (SHRI M. KANNAPPAN)

(a), (b), (c) & (d) : A Statement is laid on the Table of the House.

STATEMENT REFERRED TO IREPLY TO PARTS (a),(b),(c) & (d) OFTHE LOK SABHA STARRED QUESTION N0. 302 FC 11.12. 2000 REGARDING POWER GENERATION FROM SOLAR ENERGY.

(a), (b) & (c) : Solar Energy is used in the country through two principal routes - the thermal route for water heating, drying, cooking, etc, and the photovoltaic route for converting the light to electricity which can be used for a variety of purposes such as lighting, pumping and power generation. The Solar Photovoltaic (SPV) route uses solar cells which are encapsulated in panels (normally called modules), to generate electricity. To maximize the generation of power these are usually mounted on a tilted support structure facing the sun, rather than horizontally or vertically. A number of SPV power plants have been installed in the country for meeting the lighting, water pumping and other needs of villages and institutions. In addition, some power plants have been installed for feeding power to the local electricity grid. The location wise capacities of the SPV power plants installed so far are given in Annexure - I.

The Ministry of Non-Conventional Energy Sources is also implementing schemes for deployment of SPV systems like solar lanterns, solar home lighting systems, street lighting systems and water pumping systems. Under the programmes of the Ministry, about 3.15 lakhs solar lanterns, 1.33 lakh home lighting systems, about 0.41 lakh street lighting systems, 3,458 water pumping systems and 218 power plants of about 2,528 kWp aggregate SPV capacity have beeninstalled all over the country till 31st October 2000. The state-wise details of aggregate power generation capacity of these systems for the last three years are given in Annexure - II. Under the average Indian climatic conditions, a kilowatt peak capacity of SPV modules is estimated to generate about 1500 units of electricity per year. In addition to the above, SPV Modules have beendeployed in the country for other applications like telecommunications, railways, defence, etc.

(d) : The Ministry is implementing several programmes to promote awareness and to support the use of various solar energy products in the country by providing fiscal and financial incentives like subsidy, soft loan, 100% accelerated depreciation, concessional duty imports and excise duty exemption on certain devices and systems. The following steps have been taken up in recent years to promote the use of solar energy :

(i) Under the Solar Photovoltaic programme, the Ministry provides subsidy for non-commercial users of SPV systems / power plants.

(ii) A World Bank assisted soft loan scheme for photovoltaic market development is being implemented by the Indian Renewable Energy Development Agency Limited (IREDA), which is the financing arm of this Ministry.

(iii) Soft loan schemes have been introduced for solar thermal systems through IREDA and some banks.

(iv) R&D projects aimed at improving the efficiency, reliability and economics of solar products are being supported.

(v) A soft loan scheme for supporting photovoltaic manufacturing activities has been introduced.

(vi) Special demonstration projects in new application areas and for developing new markets are being funded through grants.

(vii) A model building bye-law for making solar assisted water heating systems mandatory in several categories of buildings has been

drafted and circulated to all State Governments.

(viii) A scheme to involve self employed workers in the promotion of solar cookers has been introduced.

(ix) Other government departments are being encouraged to use solar energy systems wherever they are cost effective.

ANNEXURE - 1

Annexure referred to in reply to Parts (a),(b) &(c) of Lok Sabha Starred Question No. 302 for 11.12.2000 regarding Power Generation from Solar Energy.

STATE-WISE LIST OF SOLAR PHOTOVOLTAIC (SPV) POWER PLANTS (INSTALLED AS ON 31ST OCTOBER, 2000)

S.NO. SITE DETAILS SPV 0

(District / Block / Location) Capacity (kWp)

Andhra Pradesh

1. Ranga Reddy/Parugula Thanda 2.40

2. Nalgonda/Bugga Thanda 3.36

3. Hyderabad/EPTRI Building 3.00

4. Medak /Salojipally 6.84

5. Hyderabad / Engineering Staff College 5.00
6. Hyderabad / Dr. Reddy`s Lab Limited 175.14
(195.74)

Arunachal Pradesh

1. West Siang/Gensi/ Akker Yangam 2.00

2. West Siang/Gensi / Piri 3.00

3. East Kameng / Seppa /Kapudada 2.90
(7.90)

Assam

1. Guwahati / Umananda Island 1.00

2. Tezpur / Sonitpur/ Neriwalm Energy Park 1.00

3. Dhubri / `Tapoban` Centre of Sacrasila Wild Life Sanctuary 1.00
(3.00)

Goa

1. South Goa / Quepem Taluqa / Corla 0.76

2. South Goa / Sanguem Taluqa / Tudou 0.96
(1.72)

Gujarat

1. Kheda / Anand / Kalyanpura 8.00

2. Panchmahal / Jhalod / Raliyati Gurjar 2.00

3. Kheda / Balasinor / Choradungri 4.00
(14.00)

Haryana

1. Sonepat / Rai / Motilal Nehru School of Sports 20.00

2. Panchkula / Pinjore / Buraj Kotia 1.00

3. Bhiwani, / Paluwas 1.20

4. Karnal / Barana 1.00

5. Gurgaon / Rahuka 1.00
(24.20)
Karnataka

1. Hassan / Handral 1.00

2. Belgaum / Sagara 2.00

3. Bangalore/ BHEL Campus 30.00
(33.00)
Kerala

1. Wynad / Pakkom / Pakkom Tribal Colony 1.00

2. Palakkad / Bommiyampadi/ Bommiampadi 1.00

3. Palakkad / Kuriarkutty / Kuriarkutty 1.20

4. Palakkad / Kottathara/ Kottathara 1.50

5. Thiruvananthapuram / Vidyuthi Bhawanam 25.00
(29.70)
Madhya Pradesh

1. Bilaspur / Lormi / Lamni 6.00

2. Bilaspur/ Kota// Kartala 3.00

3. Raipur / Kasdol / Taldadar 3.40

4. Bhopal / MPUVN Office 10.00

5. Rajgarh / Village Jaitpura Kala 100.00
6. Dewas/ M/s Steel Tubes of India limited 239.00
(361.40)
Maharashtra

1. Raigad / Uran / Morbundar (Elephanta Islands) 3.36

2. Raigad / Kesarwadi 1.54

3. Raigad / Herawadi 1.54

4. Lonawala/ Walwhan Dam 110.00

5. Mumbai/ HDFC Bank 75.60
. (192.04)
Manipur

1. Ukhrul / Chingai / Soraphung 1.00

2. Ukhrul / Phungyar / Sorbung 1.00

3. Tamenglong/ Nungba / Muktikhullen 1.00

4. Senapati / Mao-Maram / Yangkhullen 1.00

5. Ukhrul / Kamjong / Hangkau 1.00
6. Churachandpur / Thanlon / Hanship 2.00

7 Imphal/Chanchipur/Manipur Univ. (Ladies Hostel) 2.00

8. Thoubal / Kakching / Chingjao 1.00

9. Ukhrul / Kamjong / Konkhan Thana 1.00
(11.00)
Meghalaya

1. Jaintia Hills / Thadlaskein / Khpeiehtyshvi 2.00

2. Ri-Bhoi/ Nonghop / Umden 2.00

3. West Garo Hills / Selsella / Chibokgiri 2.00

4. East Khasi Hills / Mylliem / Mawietmai 2.00

5. West Garo Hills / Selsella / Dabakgiri 2.00
6. West Garo Hills/Dadenggiri/Upper Khongeapara 2.50

7 West Khasi Hills / Nongstoin / Wah Lyngdoh 2.50

8. East Garo Hills/ Rongjeng / Nengkram 2.50

9. Jaintia Hills / Amlarem / Umsalang 2.50
10. East Garo Hills / Resubelpara /Motchoepara 2.50
11. East Garo Hills / Rongjeng / Rongram 2.00
12. West Khasi Hills / Mairang / Domtraw 2.00
13. Ri - Bhoi / Umling / Umtynger 1.00
14. West Khasi Hills / Mairang / Nongrangi 1.00
15. South Garo Hills / Baghmara / Chibegiri 1.00
16. East Khasi Hills / Pynusla / Mawati 1.00
17. South Garo Hills / Baghmara / Bamgnjadugiri 1.00
18. West Garo Hills/Dadenggiri/Dabang Jabanggiri 2.00
19. East Khasi Hills / Mawkynrew/Nongpyrdi 2.00
20. West Khasi Hills / Ranikor / West Rangasora 1.00
21. East Garo Hills / Rongjeng / Upper Bamil 1.00
(37.50)
Nagaland

1. Jhani 6.00
(6.00)
Orissa

1. Bhubaneshwar/Puri/Chandaka (Telephone Exchange) 2.00

2. Puri / Gop / Ramachandi 2.00
3 Mayurbhanj/ Lulung / Forest Lodge 25.00
4 Cuttack / Bhogra / Heifer Rearing Centre 1.16
5 Kendrapara / Dangamal/ Bhitara - Kanika 3.36
6. Balasore/ Chandipur /Interim Test Range 1.50

7 Balasore/ Chandipur /Interim Test Range 1.50
(36.52)
Punjab

1. Ludhiana /Doraha/Kotli 1.00

2. Gurdaspur /Pathankot/Nazochak 1.00

3. Jalandhar /Shahkot/Sarangwal 1.00

4. Mansa / Bhikhi/Kotra Kalan 1.00

5. Mukatsar /Lambi/Badal 1.00
6. Mukatsar/Lambi/Badal 3.00

7 Bathinda / Kal Jharani (I,II,III) 7.50

8. Mansa/ Bhunder 1.50

9. Ropar/Padiala 1.50
10. Patiala/ Chhatt 3.00
11. Patiala/ Tohra 1.50
12. Mukatsar/Jhorar 3.00
13. Anandpur Sahib / Gurudwara Kesghagrh Sahib 5.00
14. Anandpur Sahib / Gurudwara Keeratpur (Patalpuri) Sahib 5.00
15. Anandpur Sahib / Gurudwara Anandgarh Sahib 5.00
16. Jallandhar / SSSNIRE 5.00
17. Bhatinda / Village Bajak 50.00
18. Chandigarh / Punjab Mini Secretariat 50.00
(146.00)

Tamilnadu

1. Chennai/ Taramani / Dr.M.S.S. Research Centre 10.00

2. Chennai/ Taramani / Dr.M.S.S. Research Centre (Phase-II) 10.00

3. Chennai / Anna University 1.00
4 - 8. Chennai/Inidividual households 5.00

9. Coimbatore / SG Palayam 25.00
10. Coimbatore / SN Palayam 25.00
11. Trichrapalli/ Kayathar Wind Farm 15.00
12. Coimbatore / M/s Udhaya semiconductors ltd. 46.00
13. Coimbatore / Village Vedambachari 100.00
(237.00)

Tripura

1. Tripura (N)/Kanchanpur/Jampai hills/Phuldangsei 4.00

2. Tripura (W)/Teliamura /Kuki Colony 2.00

3. Tripura (N) /Panisagar/ Kaishyarambari 1.50

4. Tripura (N)/Kanchapur/Jampai Hills/Reang Colony 2.85

5. Tripura (N) /Kanchapur /Khantlang 2.88
6. Tripura (N) /Kanchapur/ Jampai hills /Kanpui II 4.56

7 Tripura (N) / Kanchapur /Jampai hills/ Kanpui I 2.88

8. Tripura (W)/Jirania/Jammajoynagar 2.40

9. Tripura (W)/Bishalgarh/Gangrai 1.50
(24.57)

Uttar Pradesh

1. Sultanpur/Dhanpatganj/Mazhwara 2.00

2. Saharanpur/Behlolpur/Kotri 4.62

3. Etawa/Chakarnagar/Karaiwali 5.76

4. Jallaun/Dakor/Kurona 3.89

5. Jhansi/Chirgoan/Dewal 2.00
6. Lalitpur/Birdha/Barodia 4.08

7 Banda/Manikpur/Kihunia 5.28

8. Hamirpur/Gohand/Chandwari 7.92

9. Kanpur (D)/Rajpur/Behmai 3.00
10 Varanasi/Naugarh/Jamsoti 2.4 0
11. Etawa/Chakarnagar/Neemdanda 5.12
12. Fatehpur/Malva/Sultanpur 6.44
13. Hardoi/Sursa/Hathiyai 6.72
14. Mathura/Mathura/Nagla Parmodia 3.84
15. Unnao/Nawabganj/Ajaikhera 5.12
16. Varanasi/Naugarh/Lalori 4.53
17. Behraich/Mihipurwa/Dharampur 9.24
18. Ballia/Bariya/Nauranga 10.24
19. Mau/Ghosi/Ghosi Research Centre 7.00
20. Dehradun/Raipur/Tuntuwala 2.00
21. Almora/Garun/Darna 2.24
22. Tehri/Jaunpur/Tikri 1.68
23. Chamoli/Joshimath/Auli 2.00
24. Dehradun/Chakrata/Asoi 1.92
25. Nainital/Ramnagar/Kyari 3.60
26. Almora/Dholadevi/Talchona 2.81
27. Pauri/Rikhnikhal/Kumaldi 5.04
28. Pithoragarh/Champawat/Naikina 3.92
29. Chamoli/Ghat/Ramani 12.8
30 Pauri/Yamkeshwar/Kimsar 7.68
31. Pithoragarh/Champawat/Dhurachurakot 6.44
32. Uttarkashi/Dunda/Gyonoti 3.32
33. Pauri/Naidanda/Jhurangu 2.24
34. Pauri/Dugadda/Sajaksain 2.24
35. Pauri/Neemdanda/Bawani 2.24
36. Tehri/Pratapnagar/Goldyani 3.92
37. Uttarkashi/Naugaon/Banas 3.12
38. Nanital/Okhalkanda/Kaunta 4.09
39. Pauri/Thalisand/Margawan 6.4 0
40 Mau/ village Saraisadi 100.00
41. Aligarh / Kalayanpur 100.00
42. Lucknow / NEDA Building 25.00
(403.90)

West Bengal

1. Bankura /Bongopalpur 12.50

2. Midnapore /Digha Sea Beach (Centralised SLS) 1.75

3. Darjeeling /Kalijhora PWD Bunglow 2.50

4. Midnapore District / Nayachar Guest House 1.00

5. 24 Parganas (South)/Sagar Circuit House 4.50
6. 24 Pgs.(South)/Gosaba/Rangabelia (Hospital) 5.00

7 24 Pgs.(South)/Gosaba/Pakhiralaya ZP Bunglow 2.10

8. 24 Parganas (South)/Ganga Sagar Zillaparishad Bunglow 0.50

9. 24 Parganas (South)/ Sajnekhali Tourist Lodge 5.50
10. 24 Parganas (South)/Sagar/Kamalpur 26.00
11. 24 Parganas (South)/ Hingalgunj Flood Shelter 2.40
12. 24 Parganas (South), Sagar - Phase -II, Mtitunjoyanagar 26.00
13. 24 Parganas (South), Sagar, Gayan Bazar 25.00
14. 24 Parganas (South),Sagar,Khasmahal,Manasdweep 25.00
15. 24 Parganas (South), Sagar, Mahendraganj 25.00
16. 24 Parganas (South), Nalgarh Forest office 0.70

17. 24 Parganas (South), Dhanchi Forest office 0.70
18. 24 Parganas (South), Bhagabatpur Forest office 0.70
19. 24 Parganas (South),Patthar Protima Forest office 0.25
20. 24 Parganas (South), Peal Forest office 0.25
21. 24 Parganas (South), Jharkahal Forest office 0.25
22. 24 Parganas (South), Kulal Forest Station 0.21
23. 24 Parganas (South), Sagar, BDO Office 0.88
24. 24 Parganas (south), Sagar, Rural Hospital 20.00
25. 24 Parganas (south), Sagar, Natendrapur 28.50
26. 24 Parganas (south), Sagar, Uttarhardhanpur 28.50
27. 24 Parganas (south), Sagar, Mandir Tala 28.50
28. Calcutta / Science City. 20.00
29. Mangrove Interpretation Centre 1.00
30. Calcutta / Office of the DST & NES 3.00
31. Calcutta/ Vidyut Bhawan 25.00
(323.19)

Andaman & Nicobar Islands

1. South Andaman /Potatang 5.00

2. South Andaman /Middle Strait 5.00
3 South Andaman /Netaji Stadium 5.00

4. South Andaman /Strait Island 15.00

5. Little Andaman /Dugong Creek 15.00
6. South Andaman /Rutland 10.00

7 Little Andaman /South Bay 5.00

8. Middle Andaman /Makarthi Valley 5.00

9. Middle Andaman /Foster Valley 5.00
10. Kamorta / Daring 10.00
11. Kamora / Itoi 5.00
12. Kamorta / Trinket 5.00
13. South Andaman / Shoal Bay - 19 10.00
14. North Andaman /Mohan Pur 10.00
15. Bampooka Island / Bampooka 5.00
16. South Andaman/ NRSE Bhawan 9.00
17. North Andaman / Narcondum 1.70
18. South Andaman / Badakhari 10.00
19. Teressa / Luxi 2x 4.48
20. Teressa / Enam 1x 4.48
(149.14)

Delhi

1. Mehrauli Block/Asola Village/Forest Department 5.00
(5.00)

Lakshadweep Islands

1. Bitra Island 25.00

2. Bangaram Island 10.00

3. Kadmath Island 50.00

4. Kiltan Island 100.00

5. Minicoy Island 100.00
(285.00)

218 TOTAL 2527.52 i.e. 2528 kWp

Annexure - II referred to in reply to Parts (a),(b)&(c) of Lok Sabha Starred Question No.302 for 11.12.2000 regarding Power

Generation from Solar Energy.

STATE - WISE CAPACITY (KILOWATT PEAK) OF SPV MODULES INSTALLED IN SYSTEMS FOR LIGHTING, WATER PUMPING AND POWER PLANTS

S.NO.	STATE/UT	UPTO 31/3/98	UPTO 31/3/99	UPTO 31/3/2000
1	ANDHRA PRADESH	702	757	884
2	ARUNACHAL PRADESH	93	110	131
3	ASSAM	86	104	117
4	BIHAR	386	502	592
5	GOA	18	18	19
6	GUJARAT	226	277	329
7	HARYANA	262	332	462
8	HIMACHAL PRADESH	329	335	494
9	JAMMU & KASHMIR	244	317	472
10	KARNATAKA	236	265	304
11	KERALA	623	817	986
12	MADHYA PRADESH	746	879	910
13	MAHARASHTRA	477	498	598
14	MANIPUR	77	84	85
15	MEGHALAYA	111	117	126
16	MIZORAM	98	126	148
17	NAGALAND	25	26	26
18	ORISSA	231	339	531
19	PUNJAB	134	305	494
20	RAJASTHAN	877	1072	1326
21	SIKKIM	15	16	19
22	TAMILNADU	903	959	1047
23	TRIPURA	110	139	173
24	UTTAR PRADESH	2497	2906	3293
25	WEST BENGAL	372	569	732
26	A & N Islands	193	195	197
27	CHANDIGARH	8	19	20
28	DADRA & NAGAR HAVELI	1	1	1
29	DAMAN & DIU	0	0	0
30	DELHI	119	135	139
31	LAKSHADWEEP	140	155	288
32	PONDICHERRY	14	18	19
	TOTAL	10356	12394	14962